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Fireproof Floors  
of Pressed Steel  
Construction

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Light Weight  
Less Labor  
Shorter Time  
Great Economy



TRUSSLED CONCRETE STEEL CO.  
YOUNGSTOWN, OHIO  
REPRESENTATIVES IN PRINCIPAL CITIES

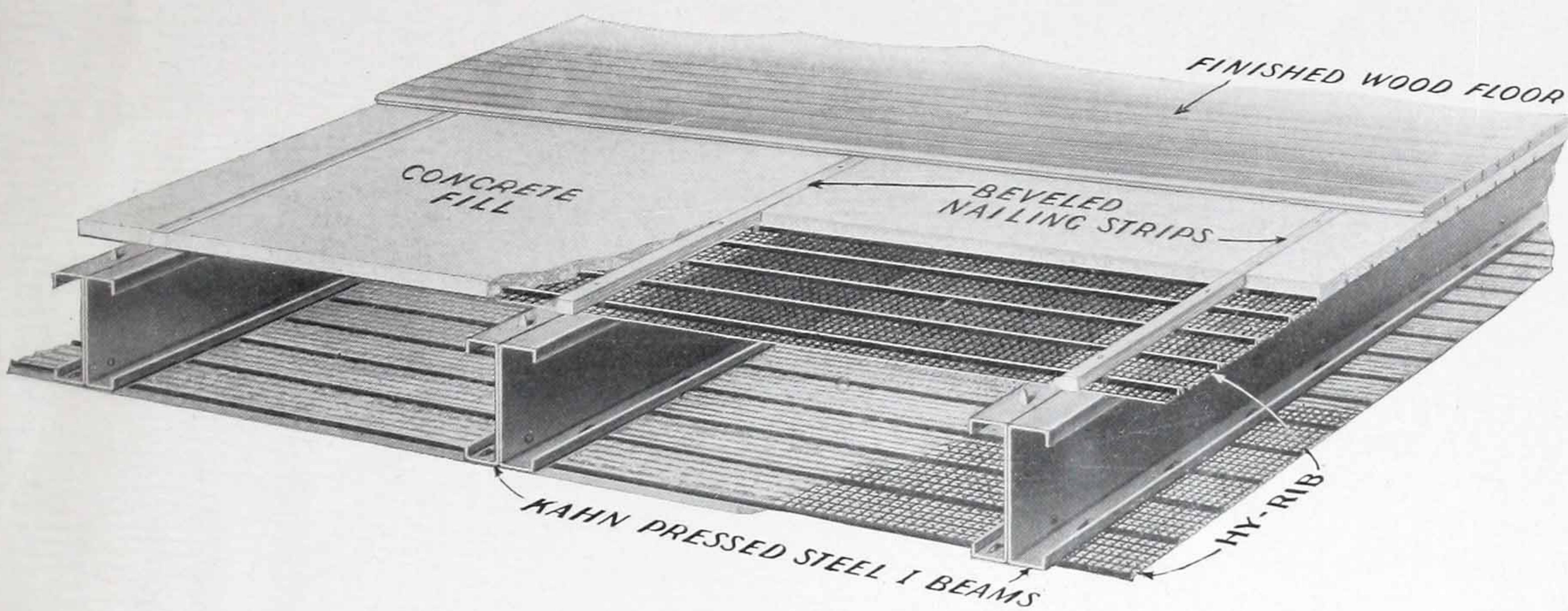


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CCA

МІЛЯРД  
ІНСТИТУТ  
ІННОВАЦІЙ



## A Fireproof Floor — Light in Weight and Low in Cost

### Kahn Pressed Steel Beams with Hy-Rib and Concrete

For floors of all buildings,—stores, apartment houses, schools, etc., here is a fire resisting construction which is simpler to erect than wood and costs very little more. It is no longer necessary to use inflammable wood joists and wood lath in even the smallest of buildings. The use of Kahn Pressed Steel Beams with Hy-Rib and concrete provides the permanence and fireproofness of reinforced concrete and steel, without requiring special equipment for installation.

No forms nor centering are required and only a comparatively small amount of materials need to be handled saving time and labor in erection. The light weight of this construction saves greatly not only in the floor itself but in the supporting beams, columns and foundations.

The Kahn Pressed Steel Beams are made in a large variety of sizes and shapes so as to meet the exact requirements of span and loading. They are furnished cut to exact length and properly manufactured so that no further work is required on them at the building site. These Pressed Steel Beams are set in place and  $\frac{3}{8}$ " Hy-Rib Lath placed on the top and bottom sides. For wood finished floors, beveled wooden strips are fastened to the beams by nails driven between the channel sections. The concrete fill is then applied to the Hy-Rib and the finished wood floor nailed to the strips. The Hy-Rib on the ceiling is readily attached to the under side of the beams by merely bending over the prongs provided in the beams. Any other type of finish can of course be applied to the floor.

The Kahn Pressed Steel Beams may be supported directly by walls, or by beams of structural steel or reinforced concrete. The use of reinforced concrete beams provides very economical construction as explained in detail on page 6 of this folder.

Eliminate the wood joists in your building by the use of these Pressed Steel Beams. The economy and advantage due to fireproofness and permanence are worth many times the slight additional first cost. Kahn Pressed Steel construction is simpler and easier to erect than wood and takes less time. Write for our detailed suggestions for your particular work.

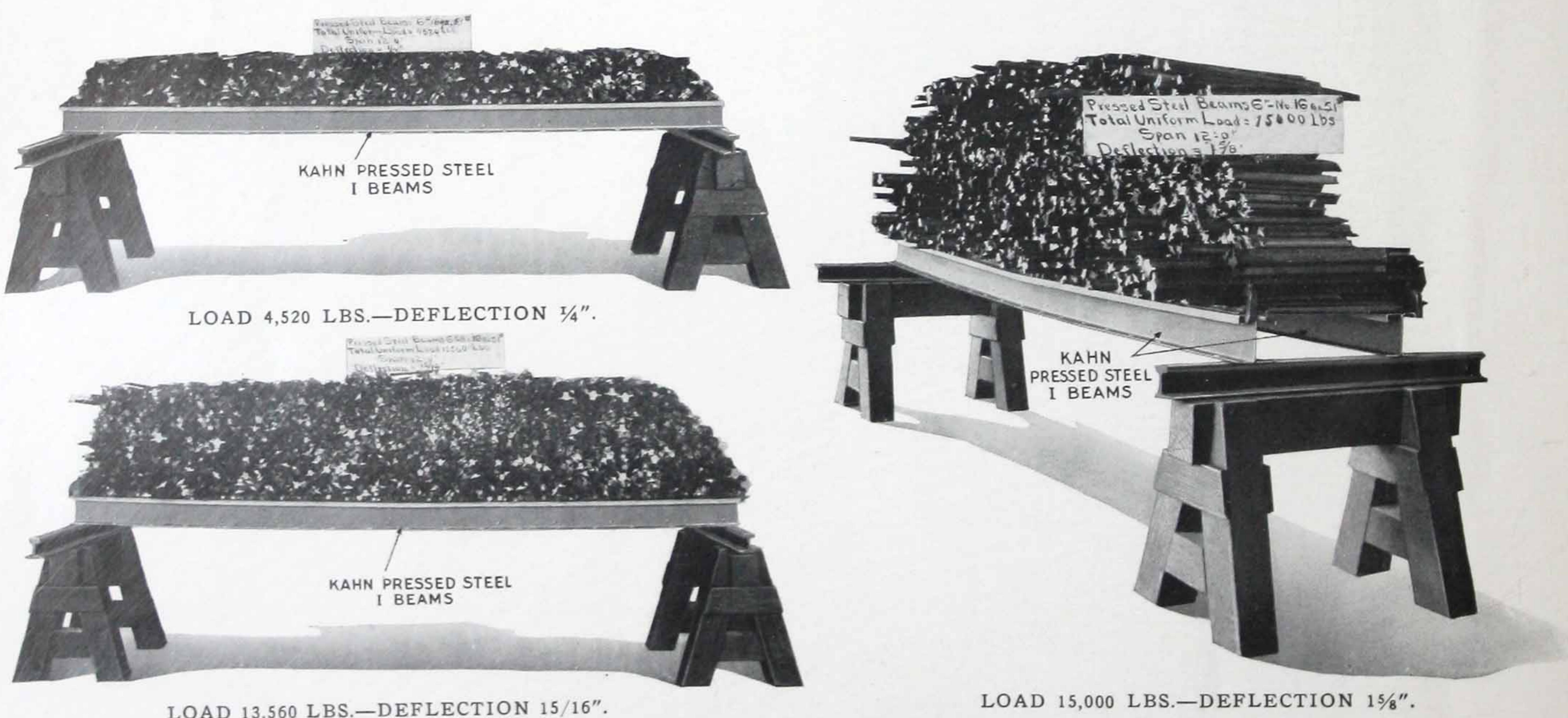
## Remarkable Test of Kahn Pressed Steel I-Beams

This test was made on two Kahn Pressed Steel I-Beams, sizes 6-inch, 16 gauge, 4.9 pounds per foot and spaced 24-inch centers. Extreme care was used in reading and measuring deflections, etc., so as to secure maximum accuracy. Bar steel was used in loading, uniformly distributed and carefully weighed. The I-Beams rested on steel rails which were spaced 12' 0" center to center.

Based on an allowable stress of 14,500 pounds per square inch, these two beams should carry a total of 4,230 pounds on 12' 0" spans. The maximum allowable deflection for a ceiling is 1/360 of the span, thus allowing a maximum deflection of  $\frac{3}{8}$ " for these beams under a load of 4,230 pounds.

The actual results of the test show the exceptional strength and stiffness of the beams. Under a load of 4,520 pounds, the deflection was only  $\frac{1}{4}$  of an inch; under a load of 13,560 pounds, the deflection was 15/16 of an inch; under 15,000 pounds, 3.56 times the calculated safe load, the deflection was 1 $\frac{1}{8}$  of an inch. The beams finally failed at a load of 16,000 pounds, 3.78 times the calculated safe load.

It is interesting to compare the stresses in these Pressed Steel I-Beams with actual tests of rolled Structural Steel I-Beams in which the factors of safety proved considerably less.



## Important Advantages of Kahn Pressed Steel Beams

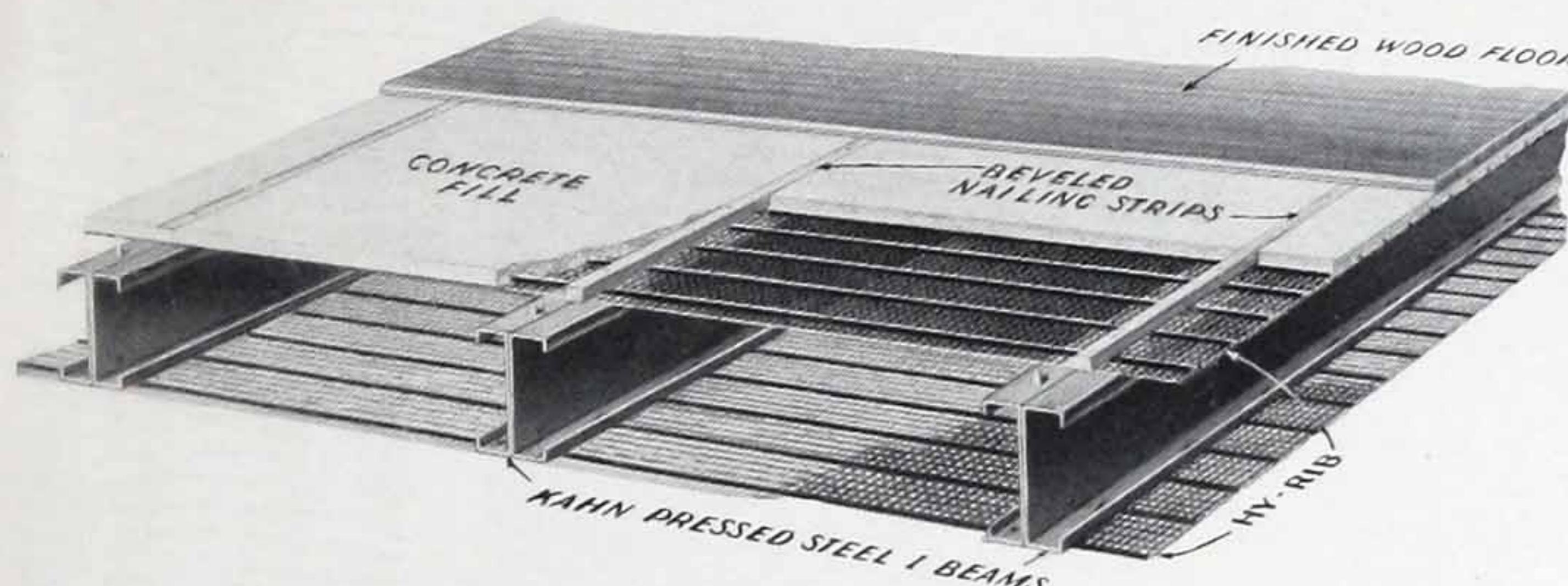
1. All beam sections are symmetrical both horizontally and vertically. There is no danger of the contractor placing beams with the wrong side up such as might occur with unsymmetrical sections.
2. Wide choice in sections and heights of members, in most instances providing two widths of flange for the one depth of the beam, in addition to various gauges of metal.
3. Standard rivets used to unite the channels forming the I-Beams and riveting done under powerful press.
4. Use of  $\frac{3}{8}$ " Hy-Rib Lath for floor centering and ceiling does away with need for bridging. The ribs act as a strut and thoroughly brace beams together.
5. The stiffness of Hy-Rib prevents sagging thereby saving material in concreting and labor and material in plastering.
6. The extra turned flanges on both faces of beams and studs add greatly to their stiffness and strength. The calculation of all beams is based on net sections deducting the holes punched out for the prongs.

## Fire-Resisting Floors of Kahn Pressed Steel Construction

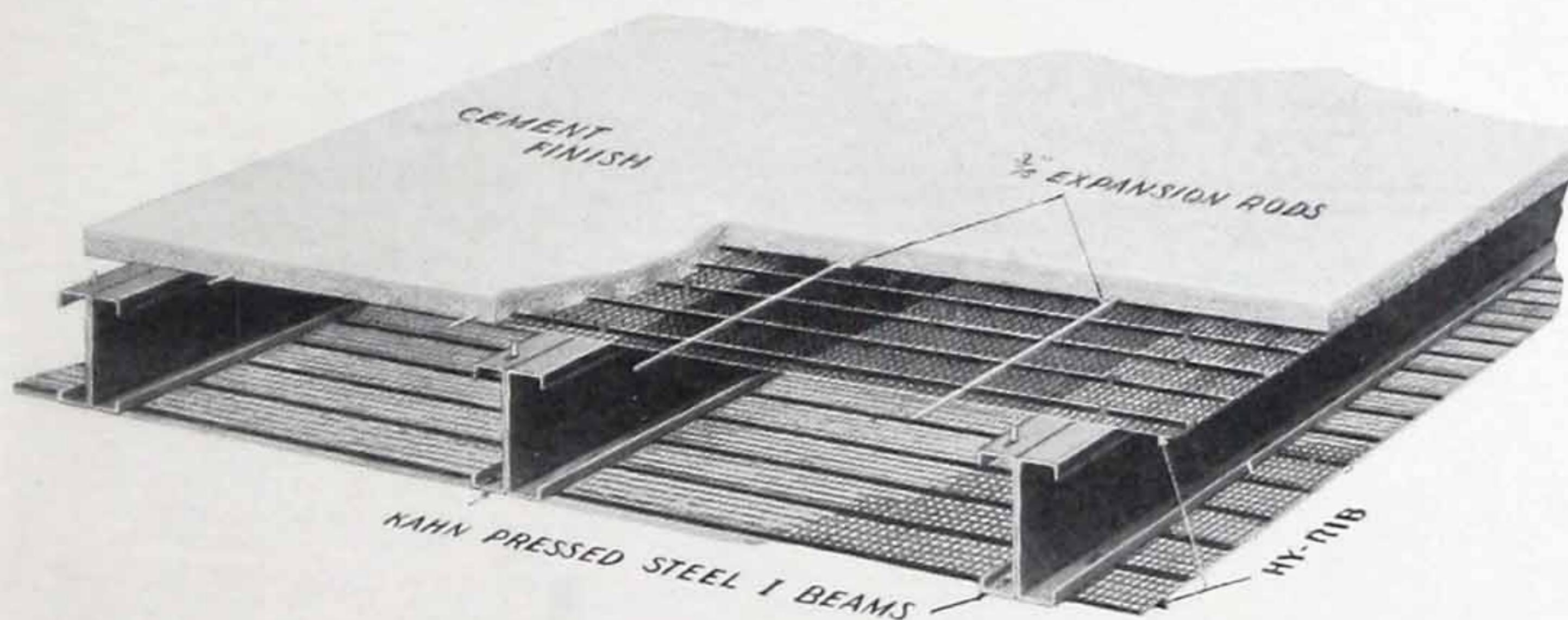
The floors consist of Pressed Steel I-Beams of proper size and section to carry the required load.  $\frac{3}{8}$ " Hy-Rib Lath is laid on top of these I-Beams, with the ribs extending across them and is secured to the beams by the prongs in the top flange or by the nailing of the sleepers to the joist. This Hy-Rib not only serves as forms and reinforcing for the concrete but so greatly stiffens the construction as to eliminate all necessity for bridging, the ribs acting as a strut between the beams. Hy-Rib for ceilings is attached to the I-Beams by means of the prongs punched from the lower flange.

$\frac{3}{8}$ " Hy-Rib Lath of proper gauge is used with the pressed steel beams for floors and ceiling.

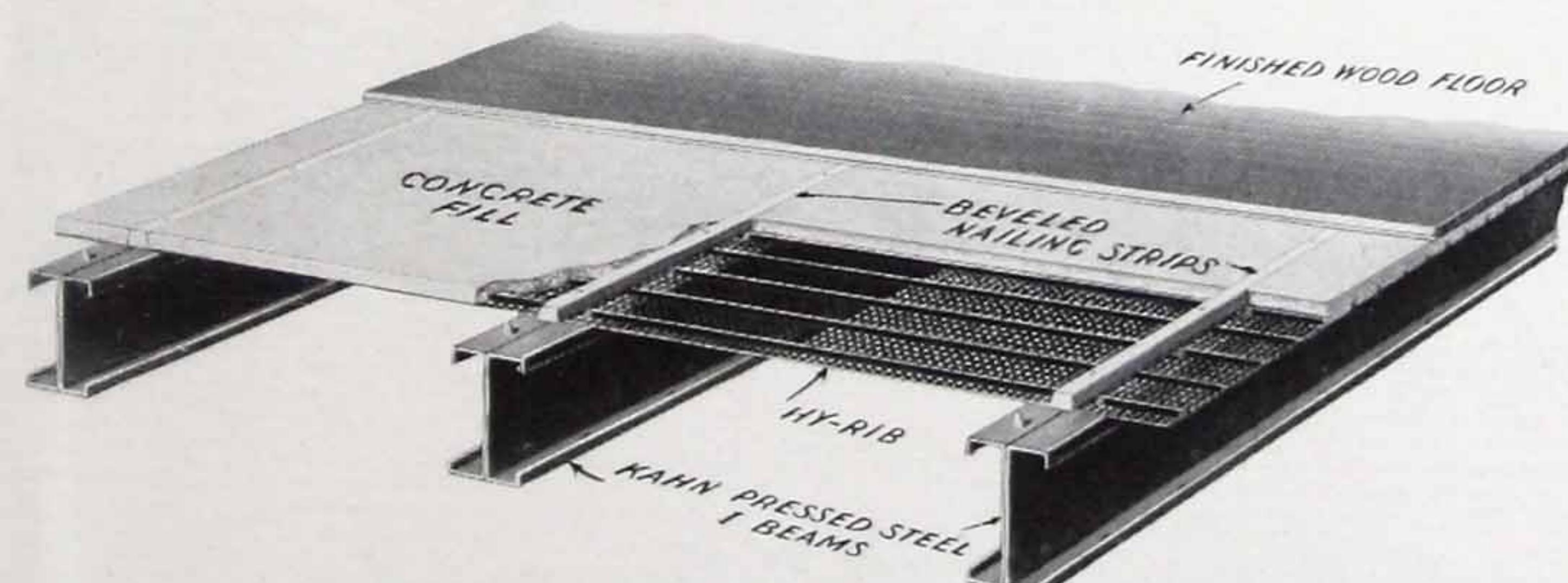
The Kahn Pressed Steel I-Beams are manufactured in such a large variety of shapes and sizes as to meet all requirements of span and loading. Note particularly that the I-Beam sections are absolutely symmetrical both vertically and horizontally. There is no possibility of a contractor placing them with wrong sections on the lower side such as may happen where the sections are unsymmetrical. The turned flanges on both the upper and lower flanges of the beam greatly stiffen and strengthen the I-Beam.



STANDARD PRESSED STEEL FLOOR CONSTRUCTION WITH WOOD FLOOR FINISH AND PLASTERED CEILING.



STANDARD PRESSED STEEL FLOOR CONSTRUCTION WITH CEMENT FINISH AND PLASTERED CEILING.



STANDARD PRESSED STEEL FLOOR CONSTRUCTION WITH WOOD FLOOR FINISH AND WITHOUT CEILING.

The tables given for carrying capacities are based on the actual **net sections** of the steel after having deducted the area for punching out of the prongs. Standard rivets are used for riveting together the channel sections that form the I-Beams.

Where a wood floor is desired, beveled nailing strips are used over the top of the I-Beams and are fastened to them by nails driven between the channel sections. Between the nailing strips a concrete fill is applied. The nailing strips are ordinarily  $1\frac{1}{2}$ " deep. The finished wood floor is attached directly to these nailing strips.

For a floor with cement finish, expansion rods are placed over the Hy-Rib and concrete applied as shown in illustration. Owing to its stiffness, there is no appreciable sagging of the Hy-Rib thus saving greatly in amount of concrete required. Where it is not necessary to have a plastered ceiling, as in basements, the Hy-Rib may be omitted from the lower flange as shown in illustration.

### WEIGHT OF KAHN PRESSED STEEL FLOORS.

#### Wood Floor With Plastered Ceiling

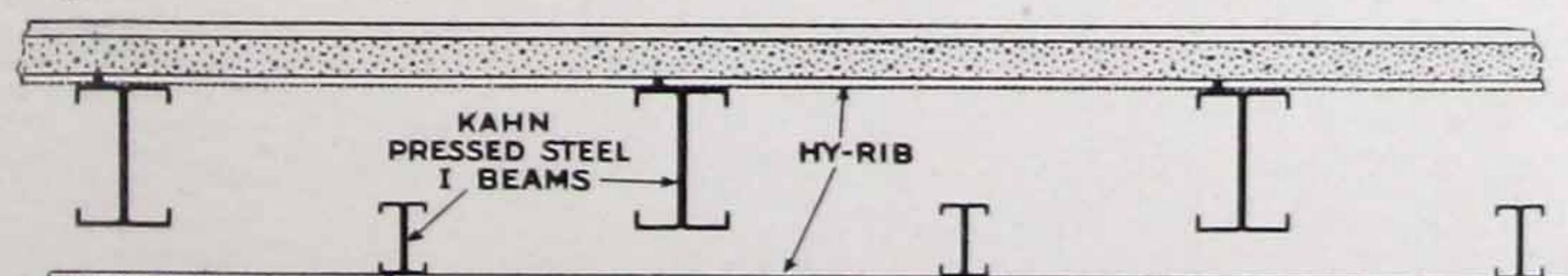
Weight per square foot.

Wood flooring .....	3 pounds
$1\frac{1}{2}$ " Concrete slab.....	18 pounds
Kahn Pressed Steel joist (average weight) .....	3 pounds
Plaster ceiling .....	8 pounds
Total .....	32 pounds

For cement finished floor deduct for weight of wood finish, making proper allowance if the floor varies from  $1\frac{1}{2}$  inches in thickness. For floors without ceiling deduct weight of ceiling from above figures.

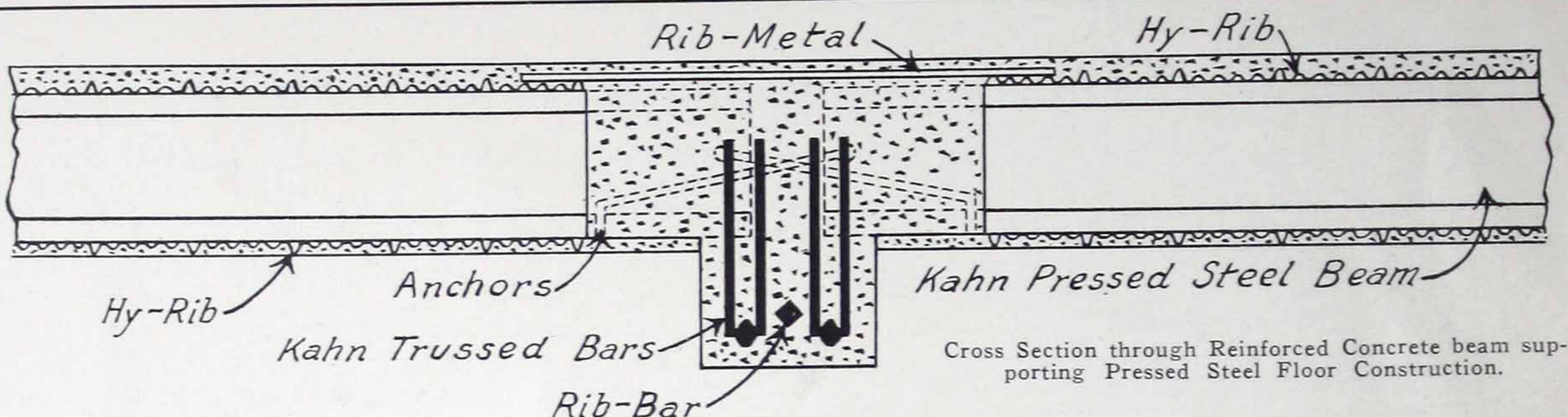
### Soundproof Floor Construction

When the requirements demand an absolute sound proof construction for floors, this is readily accomplished by using an independent system of framing for the floor and ceiling. The Pressed Steel Beams for the floors support only the floor construction, and another set of beams of smaller section support only the ceiling, without any connection between the two sets of beams.



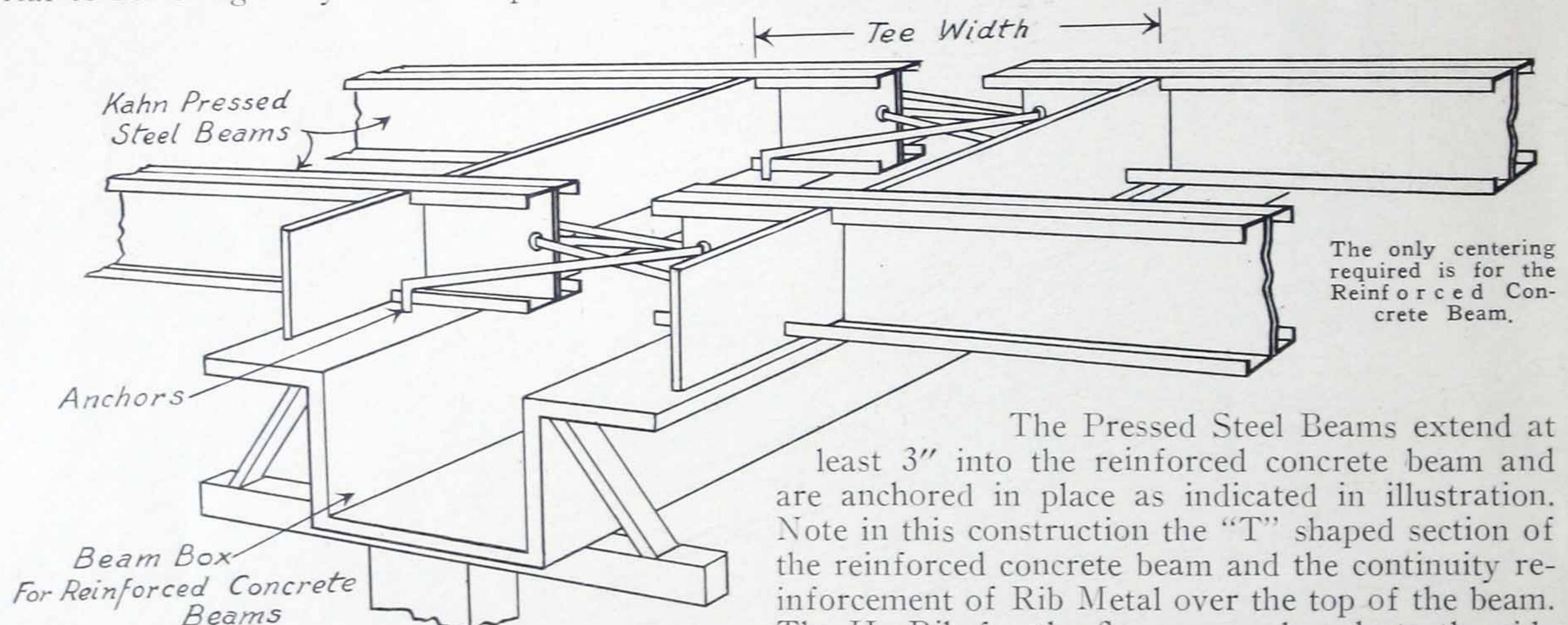
SOUNDPROOF FLOOR CONSTRUCTION.

There is a space of 2 inches between the ceiling and the bottom of floor beams, so that the rooms are absolutely insulated from those above and below. This provides a sound proof floor construction which is only 2 inches thicker than the ordinary method of construction.



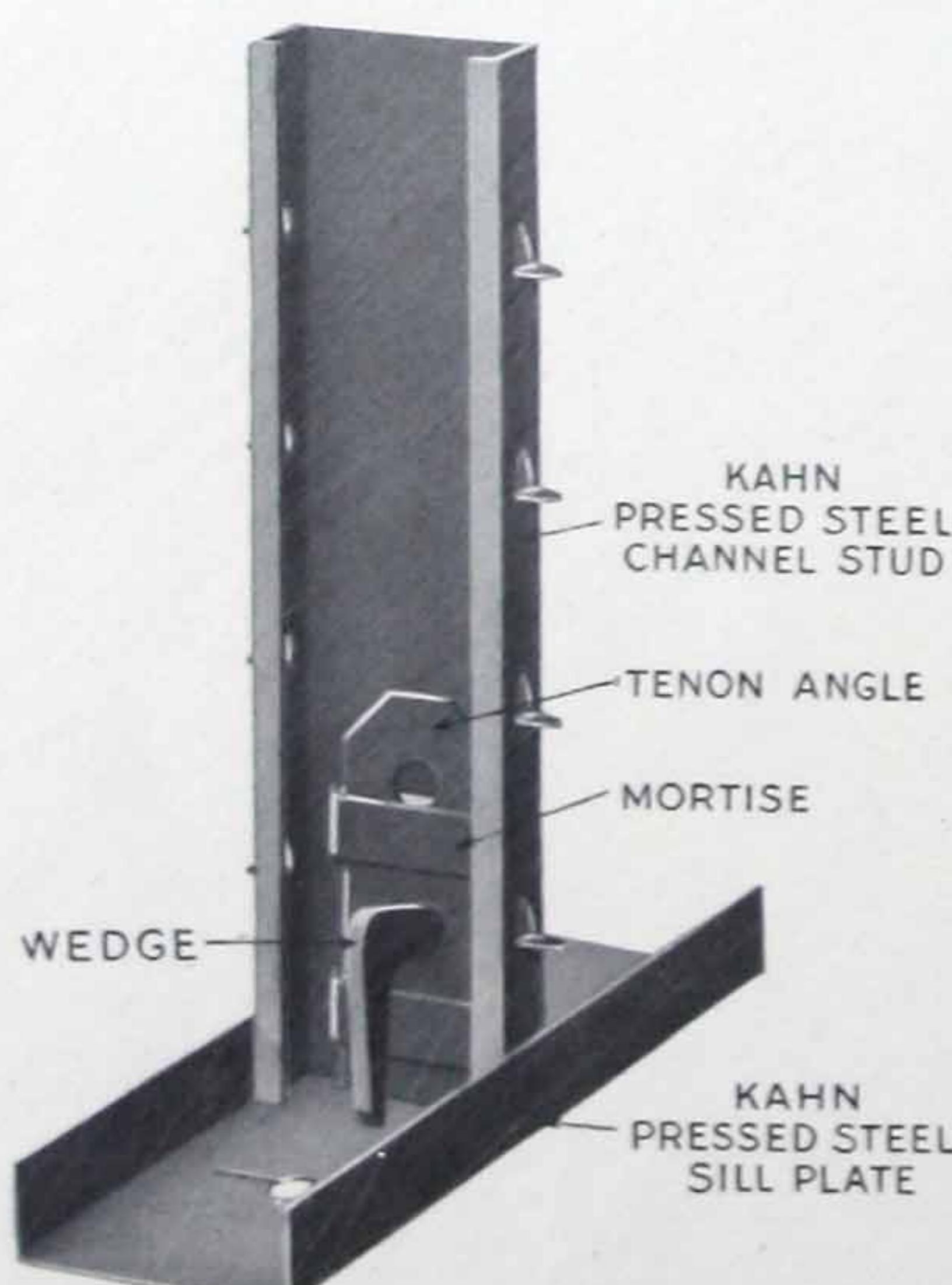
## Kahn Pressed Steel Joists with Reinforced Concrete Beams

The use of reinforced concrete beams and columns to support Pressed Steel floors provides a most economical construction. No forms whatever are required for the floors, the only centering being for the columns and beams as indicated in the illustration below. A reinforced concrete beam costs considerably less than a structural steel beam which is fireproofed by concrete, tile, or lath and cement plaster. The elimination of centering and the reduced amount of material to handle greatly increase speed of construction.



The Pressed Steel Beams extend at least 3" into the reinforced concrete beam and are anchored in place as indicated in illustration. Note in this construction the "T" shaped section of the reinforced concrete beam and the continuity reinforcement of Rib Metal over the top of the beam. The Hy-Rib for the floors extends only to the side of the "T" so that the concrete for the beams and the  $1\frac{1}{2}$ " floor is poured at one operation. The Hy-Rib can then be attached to the under side of the Pressed Steel Beams and the ceiling plastered.

The light weight of the Pressed Steel Floor Construction saves material in the supporting beams, columns and foundations.  $\frac{3}{8}$ " Hy-Rib Lath is used for the floor and ceiling. The tables on pages 10 and 11 give the carrying capacity of various sizes of Pressed Steel Beams.

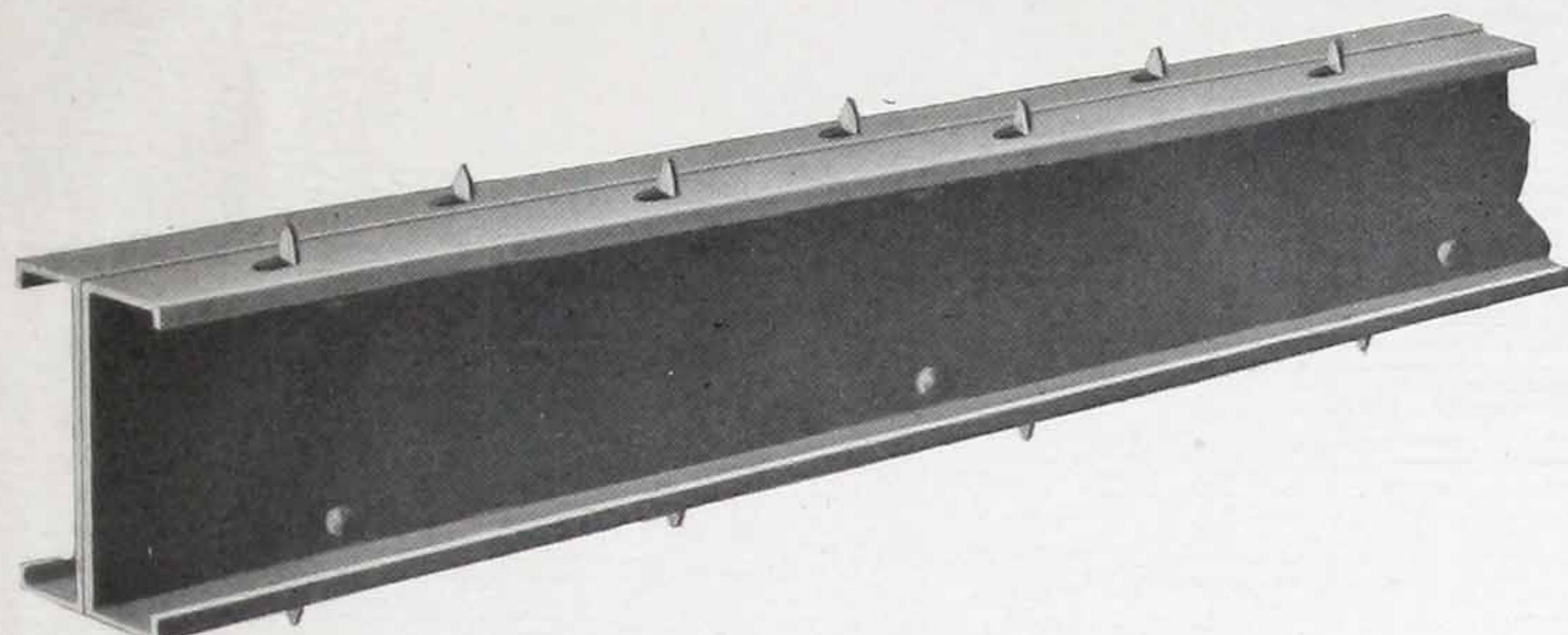


The tenon angle is passed through the sill plate from below and engages the mortise in the stud. The wedge is then driven in place by the blow of a hammer and holds the joint rigidly.

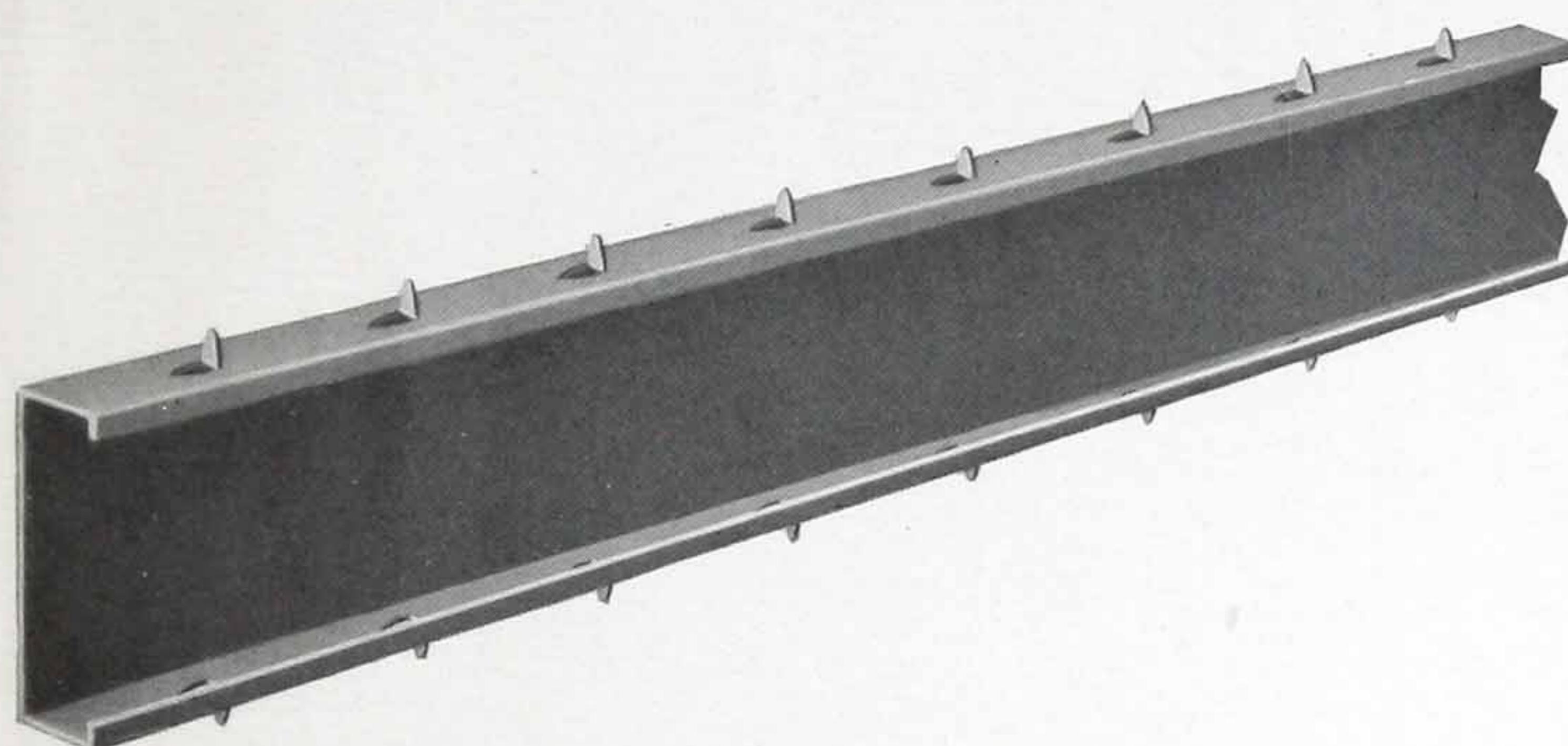
## Other Applications of Kahn Pressed Steel Construction

As indicated on next page, Kahn Pressed Steel Sections include all types and sizes of channels, studs, angles, furring strips, sill plates, beams, etc. The construction is extensively used in walls and partitions. The  $\frac{3}{8}$ " Hy-Rib Lath is readily attached to the Pressed Steel members by merely bending down the prongs. The improved standard connection between Pressed Steel Members eliminates all punching, bolting and riveting. The construction is also widely used in Multiple Houses for Industrial Companies, Mines, etc.

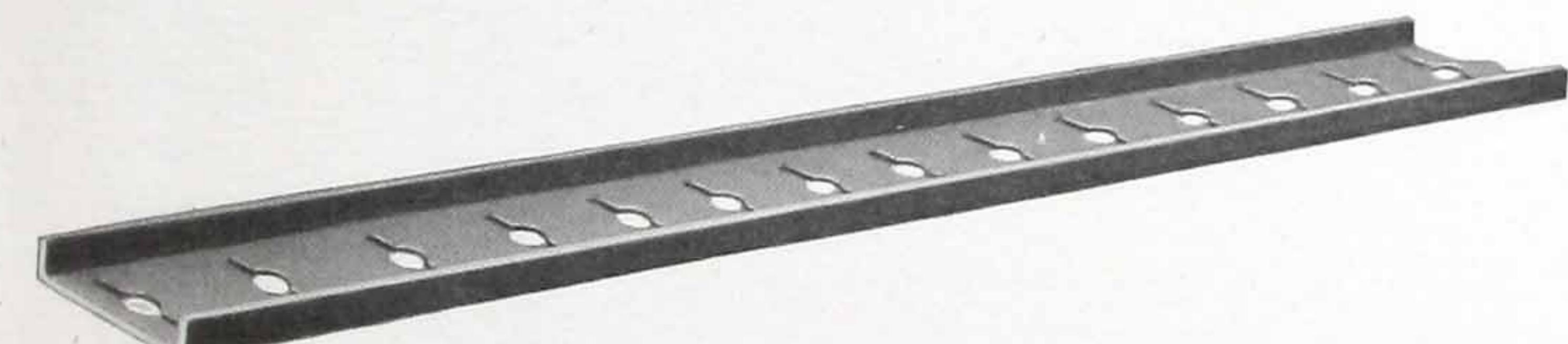
For further information write for our general pamphlet on Kahn Pressed Steel Construction.



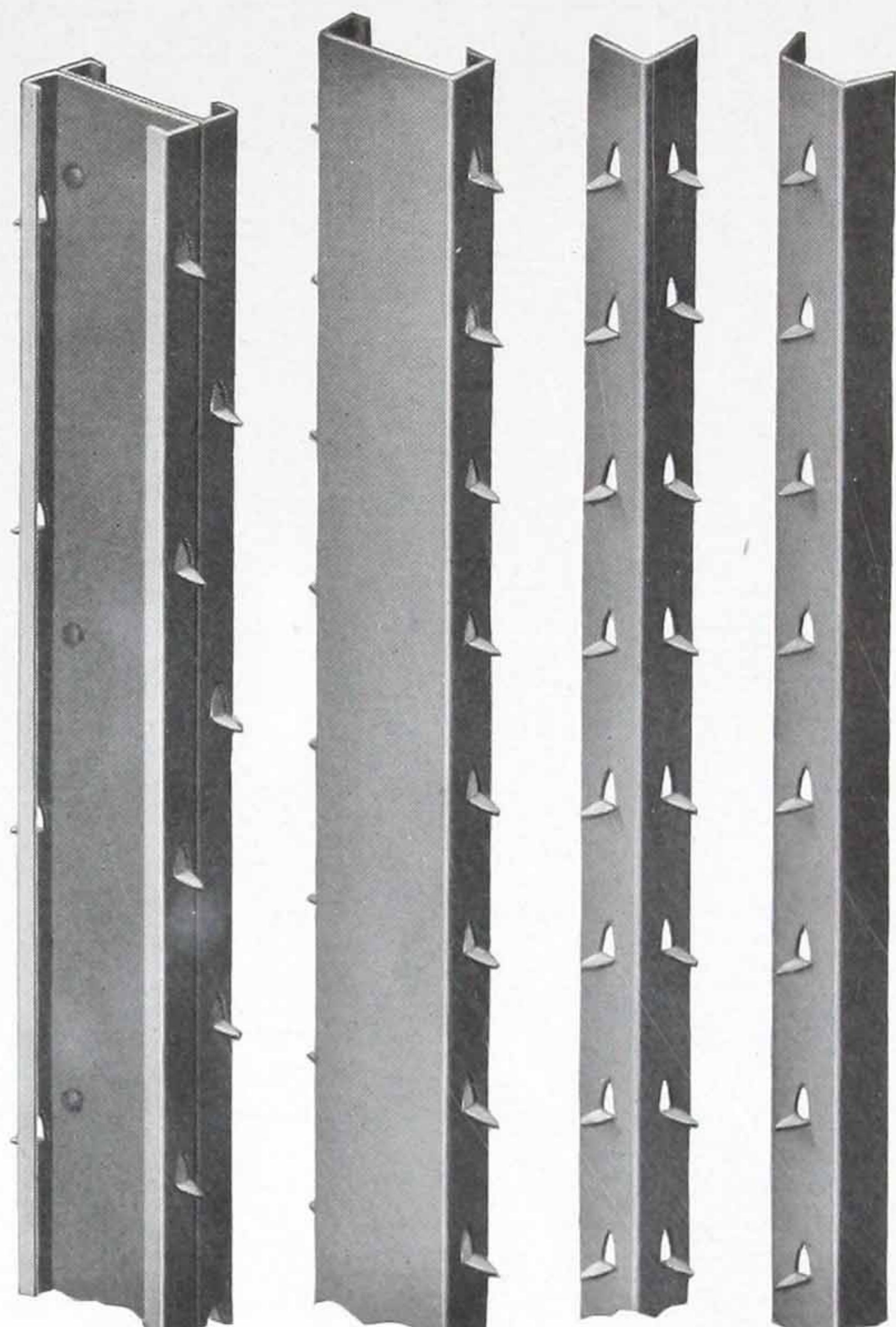
KAHN PRESSED STEEL I-BEAM.



KAHN PRESSED STEEL CHANNEL.



KAHN PRESSED STEEL CAP AND SILL PLATE.



Kahn  
Pressed  
Steel  
H-Stud.

Kahn  
Pressed  
Steel  
Channel  
Stud.

Kahn  
Pressed  
Steel  
Angle  
Stud.

Kahn  
Pressed  
Steel  
Furring  
Strip.

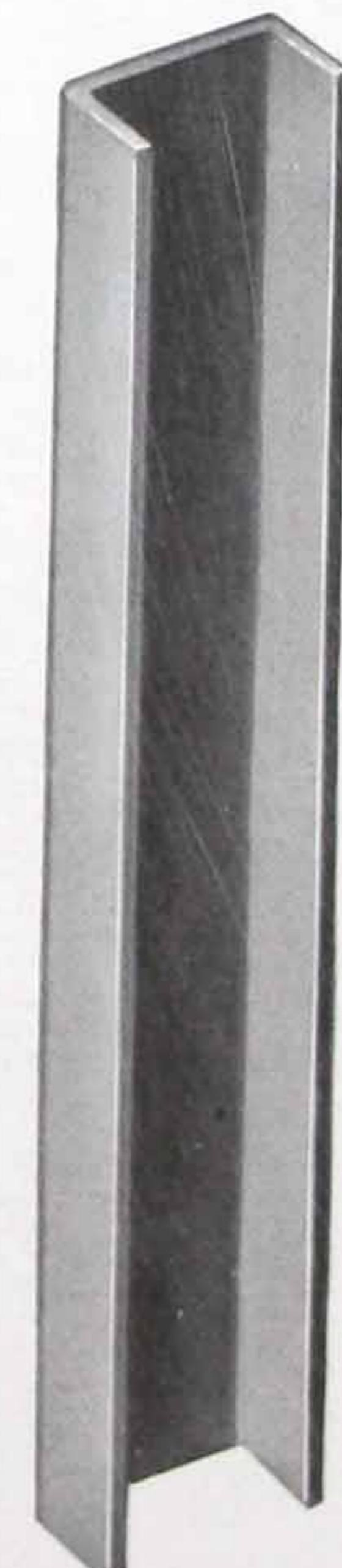
## Sections of Kahn Pressed Steel Building Construction

Kahn Pressed Steel Sections are manufactured from the highest grade of steel under powerful presses, so as to insure their greatest strength and absolute accuracy. The large variety of shapes and sizes insures greatest economy in designs. In most instances there are two widths of flange for each depth of beam, in addition to various gauges of metal.


The beam sections are symmetrical in shape both horizontally and vertically, eliminating all danger of placing the beams with the wrong side up. The additional turned flanges greatly stiffen and strengthen these beams.

All members are cut to exact length and properly punched and fabricated for all connections. On the flanges of the sections, prongs are provided for attaching the Hy-Rib. Slots and holes are punched in jamb, sill and lintel members to permit nailing of rough bucks and wood trim.

All pressed steel material is painted with a special rust-resisting paint before shipment.



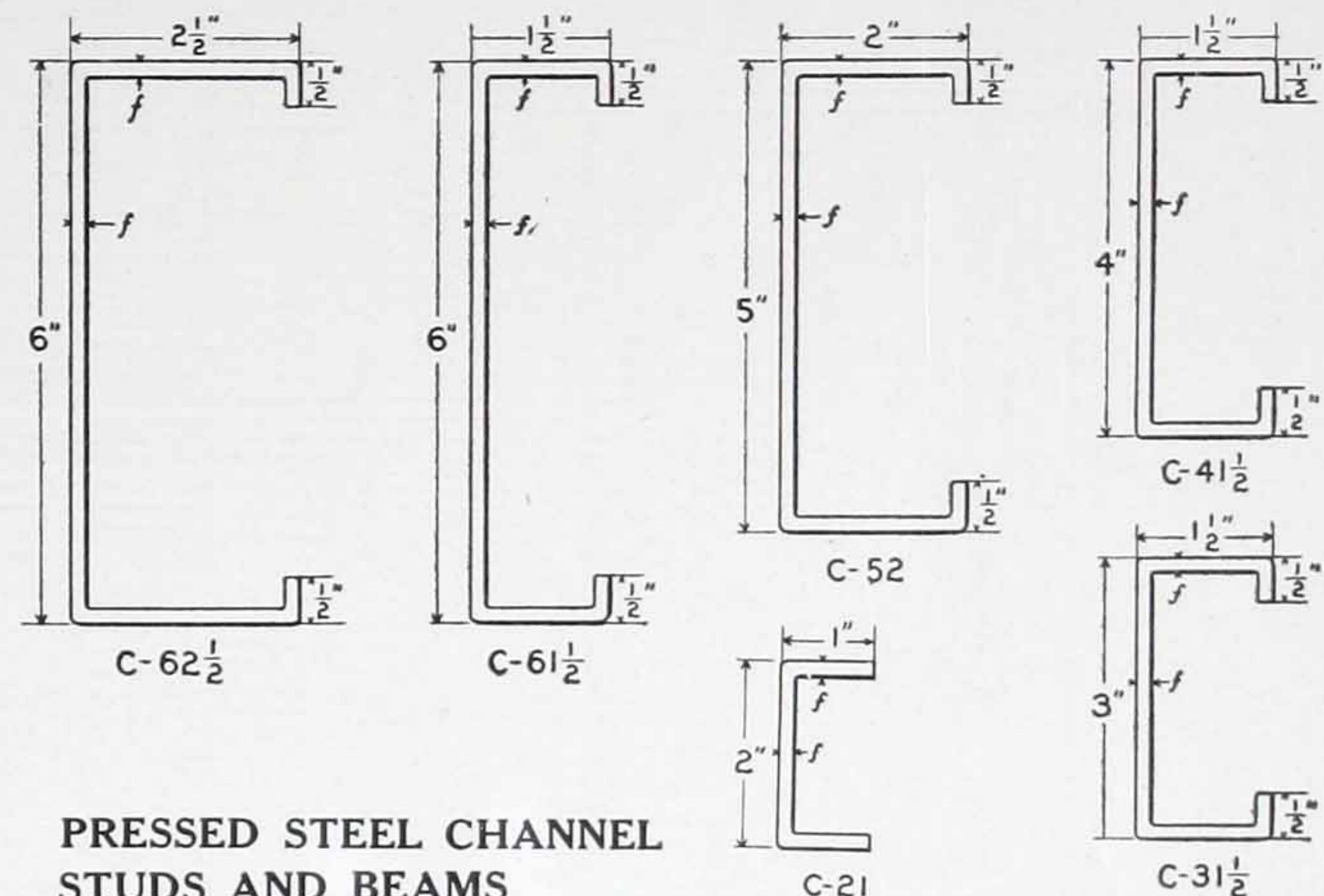
Kahn Pressed  
Steel Channels  
without prongs



KAHN PRESSED STEEL I-BEAMS AND H-STUDS

PRESSED STEEL I-BEAMS AND H-STUDS

Section Index	Depth of Beam inches	Width of Flange inches	Weight per foot lbs.	Thickness of Flange (f)		Thickness of Web (w)	
				Decimal	Fractional	Decimal	Fractional
B-127 14	12	7	10.4	.078125	$\frac{5}{64}$	.15625	$\frac{5}{32}$
B-125 14	12	5	9.3	.078125	$\frac{5}{64}$	.15625	$\frac{5}{32}$
B-106 14	10	6	8.8	.078125	$\frac{5}{64}$	.15625	$\frac{5}{32}$
B-105 14	10	5	8.3	.078125	$\frac{5}{64}$	.15625	$\frac{5}{32}$
B-96 16 14	9	6	6.6 8.3	.0625 .078125	$\frac{1}{16}$ $\frac{5}{64}$	.1250 .15625	$\frac{1}{8}$ $\frac{5}{32}$
B-95 16 14	9	5	6.2 7.8	.0625 .078125	$\frac{1}{16}$ $\frac{5}{64}$	.1250 .15625	$\frac{1}{8}$ $\frac{5}{32}$
B-85 16 14	8	5	5.8 7.3	.0625 .078125	$\frac{1}{16}$ $\frac{5}{64}$	.1250 .15625	$\frac{1}{8}$ $\frac{5}{32}$
B-84 16 14	8	4	5.4 6.7	.0625 .078125	$\frac{1}{16}$ $\frac{5}{64}$	.1250 .15625	$\frac{1}{8}$ $\frac{5}{32}$
B-75 16 14	7	5	5.4 6.7	.0625 .078125	$\frac{1}{16}$ $\frac{5}{64}$	.1250 .15625	$\frac{1}{8}$ $\frac{5}{32}$
B-74 16 14	7	4	4.9 6.1	.0625 .078125	$\frac{1}{16}$ $\frac{5}{64}$	.1250 .15625	$\frac{1}{8}$ $\frac{5}{32}$
B-65 16 14	6	5	4.9 6.1	.0625 .078125	$\frac{1}{16}$ $\frac{5}{64}$	.1250 .15625	$\frac{1}{8}$ $\frac{5}{32}$
B-63 16 14	6	3	4.1 5.0	.0625 .078125	$\frac{1}{16}$ $\frac{5}{64}$	.1250 .15625	$\frac{1}{8}$ $\frac{5}{32}$
B-54 16 14	5	4	4.1 5.0	.0625 .078125	$\frac{1}{16}$ $\frac{5}{64}$	.1250 .15625	$\frac{1}{8}$ $\frac{5}{32}$
B-43 16 14	4	3	3.2 4.0	.0625 .078125	$\frac{1}{16}$ $\frac{5}{64}$	.1250 .15625	$\frac{1}{8}$ $\frac{5}{32}$
B-33 16 14	3	3	2.8 3.5	.0625 .078125	$\frac{1}{16}$ $\frac{5}{64}$	.1250 .15625	$\frac{1}{8}$ $\frac{5}{32}$



PRESSED STEEL CHANNEL STUDS AND BEAMS

Section Index	Height inches	Width of Flange inches	Weight per lin. foot lbs.	Thickness of Flange and Web, inches	
				Decimal	Frac-tional
C-62 1/2 16 14	6	2 1/2	2.45 3.05	.0625 .078125	$\frac{1}{8}$ $\frac{5}{64}$
C-61 1/2 16 14	6	1 1/2	2.05 2.50	.0625 .078125	$\frac{1}{8}$ $\frac{5}{64}$
C-52 16 14	5	2	2.05 2.50	.0625 .078125	$\frac{1}{8}$ $\frac{5}{64}$
C-41 1/2 16 14	4	1 1/2	1.60 2.00	.0625 .078125	$\frac{1}{8}$ $\frac{5}{64}$
C-31 1/2 16 14	3	1 1/2	1.40 1.75	.0625 .078125	$\frac{1}{8}$ $\frac{5}{64}$
C-21 16 14	2	1	0.80 1.00	.0625 .078125	$\frac{1}{8}$ $\frac{5}{64}$

3/8"  
Hy-Rib  
Lath



## Hy-Rib with Kahn Pressed Steel Construction

Hy-Rib is a steel sheathing, stiffened by rigid, deep ribs, formed from the same sheet of steel. These ribs give great stiffness to the material so as to eliminate the use of wood forms in floors and roofs, and stiffening members in partitions, walls, and ceilings.

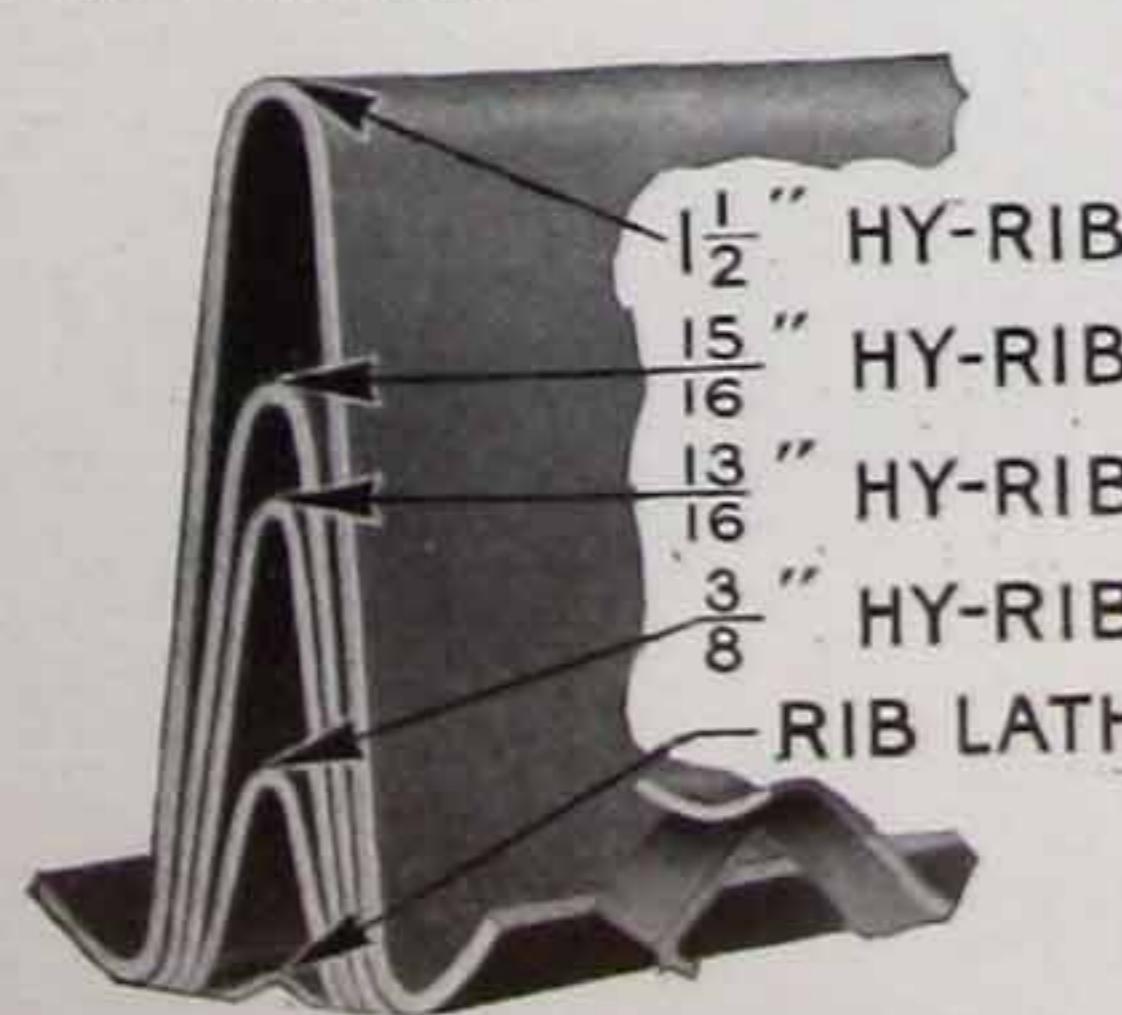
3/8" Hy-Rib Lath is ordinarily used in connection with Kahn Pressed Steel Construction, as it supplies sufficient stiffness to span the standard spacings of joists. The accompanying table indicates spans for various gauges of 3/8" Hy-Rib Lath, but ordinarily 24 gauge is used for floors and 28 gauge for ceilings, for joist spacings up to 23 1/2 inches. The Hy-Rib is readily attached to the pressed steel shapes by simply bending down the prongs provided in the steel members.

3/8" Hy-Rib	* Clear distance between studs for walls and partitions		* Clear distance between supports for ceilings	
	24 gauge	36"	26 gauge	32"
26 gauge	32"	30"		
28 gauge	24"	22"		

\* Add width of flange of section to obtain center to center spacing.

Hy-Rib is also furnished in greater depths, which provide greater stiffness and permit wider spacing of supports. In this way Hy-Rib exactly meets all requirements of strength and economy.

Type of Hy-Rib	Formerly Called	Height of Ribs	Spacing of Ribs	Width of Sheets	Gauge Nos. U.S. Standard
1 1/2" Hy-Rib	Deep-Rib	1 1/2"	7"	12"	22, 24, 26
1 5/8" Hy-Rib	7-Rib	1 5/8"	4"	24"	22, 24, 26, 28
1 3/8" Hy-Rib	3-Rib	1 3/8"	8"	16"	24, 26, 28
3/8" Hy-Rib	6-Rib	3/8"	4"	20"	24, 26, 28



Standard lengths, 6, 8, 10 and 12 feet. Other lengths cut without charge except for waste.

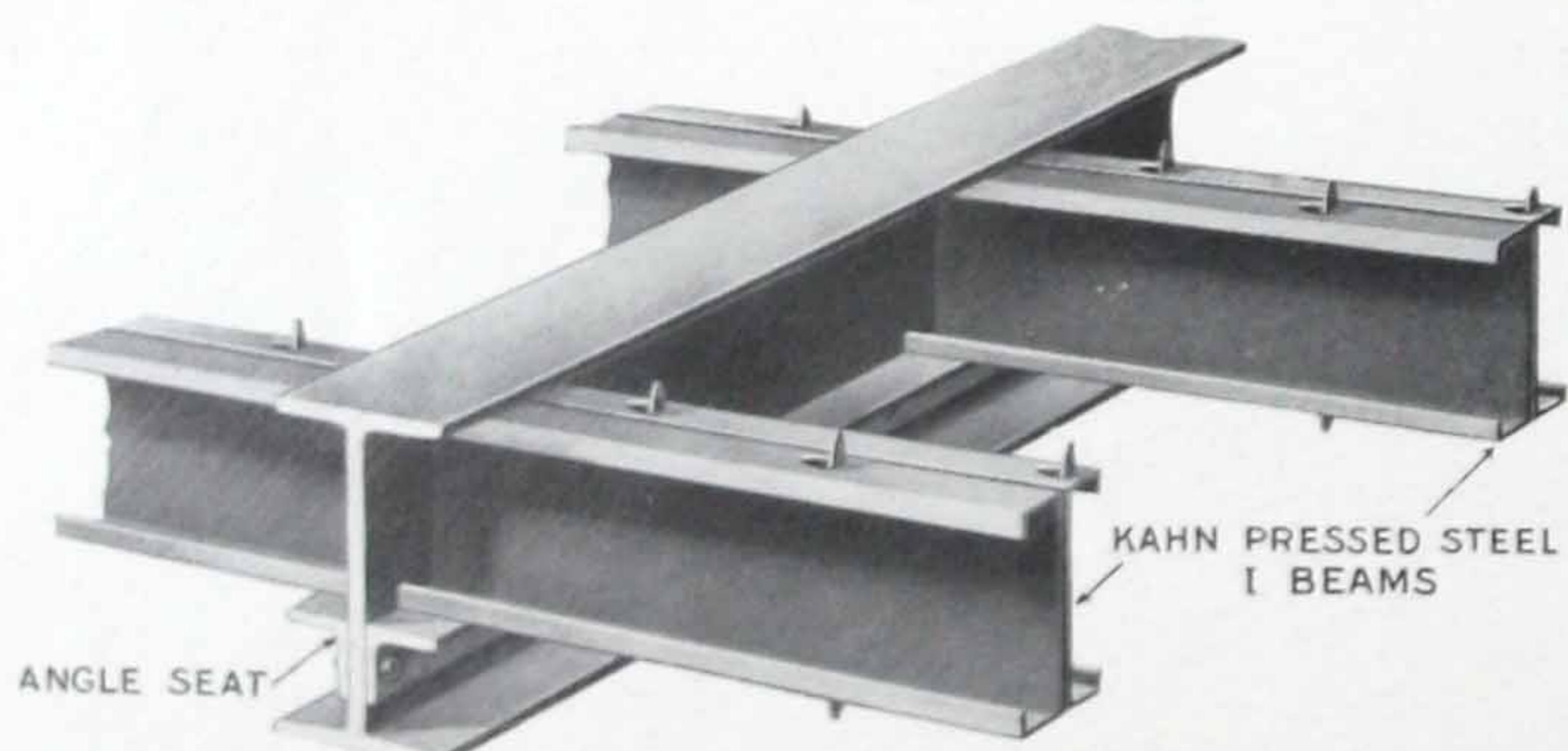
## Safe Loads Uniformly Distributed for Kahn Pressed Steel I-Beams in Pounds

Fiber Stress = 14500 lbs. per sq. in.

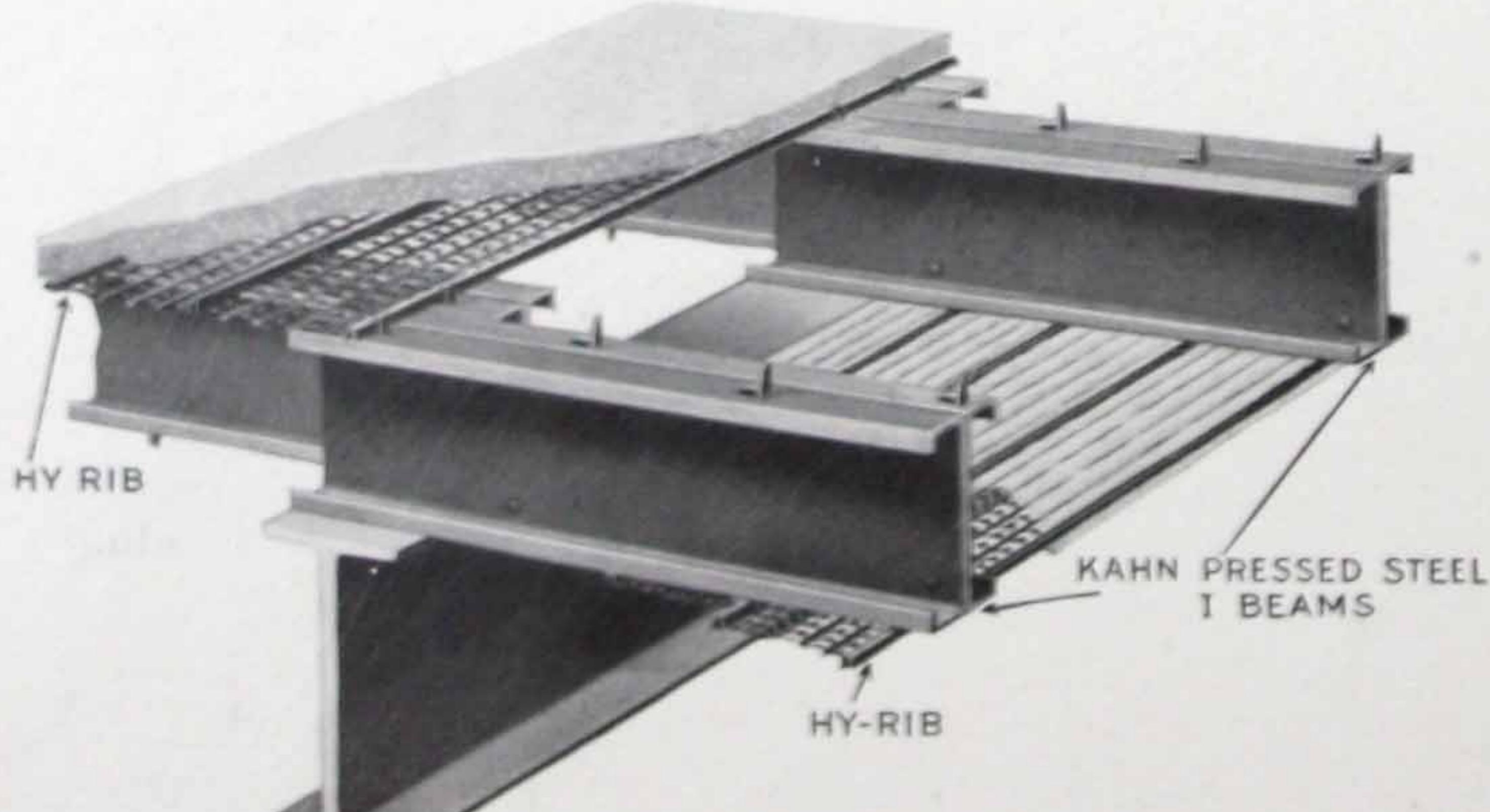
**Safe loads include weight of construction**—For safe live loads deduct weight of construction.

Safe loads for Pressed Steel Channel Beams are one-half of the above.

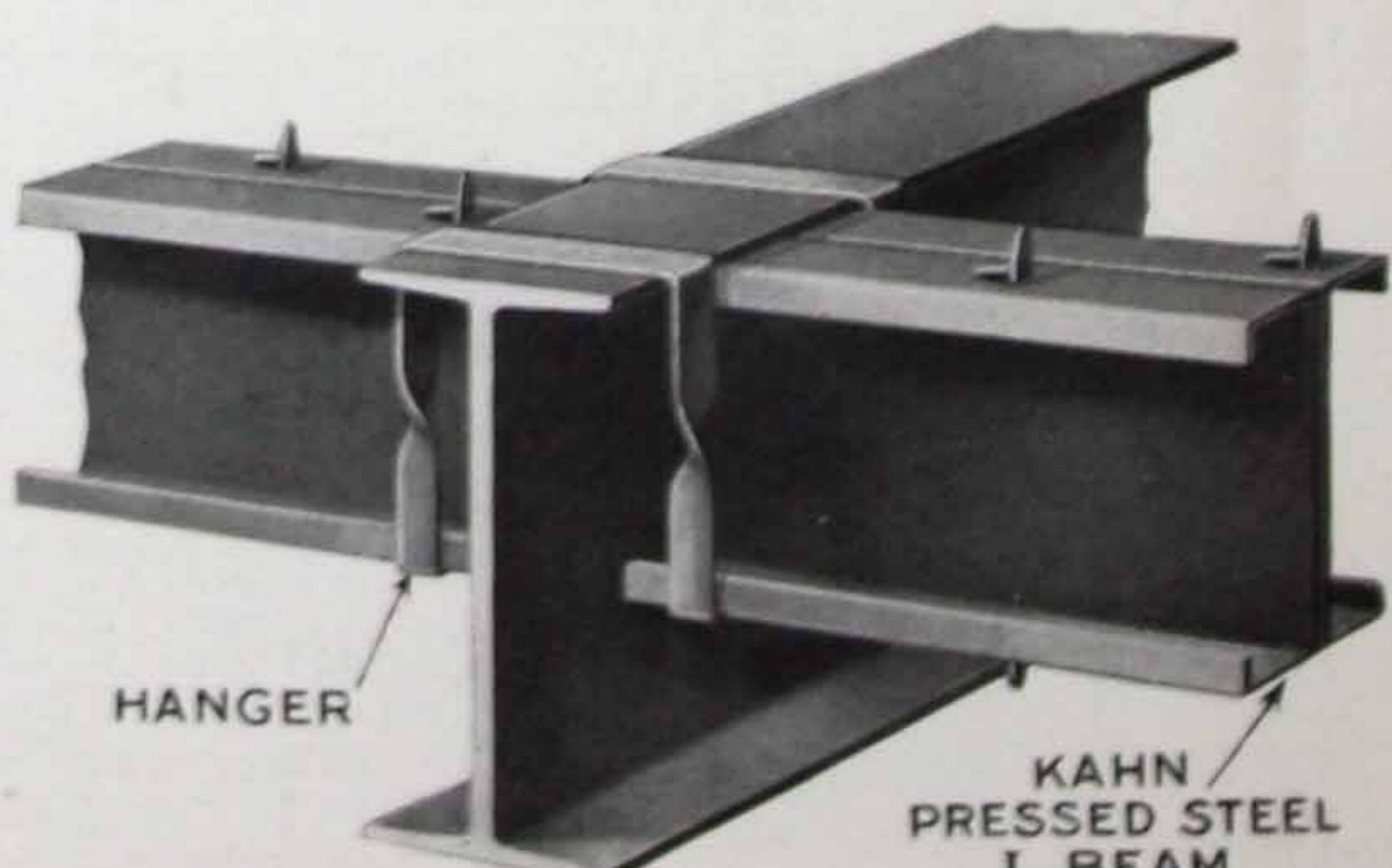
The tables given for carrying capacities are based on the **ACTUAL NET SECTIONS** of the steel after having deducted the area for punching out of the prongs. Standard rivets are used for riveting together the channel sections that form the I-Beams.



SUPPORTING PRESSED STEEL I-BEAM ON ANGLE RIVETED  
TO STRUCTURAL STEEL.



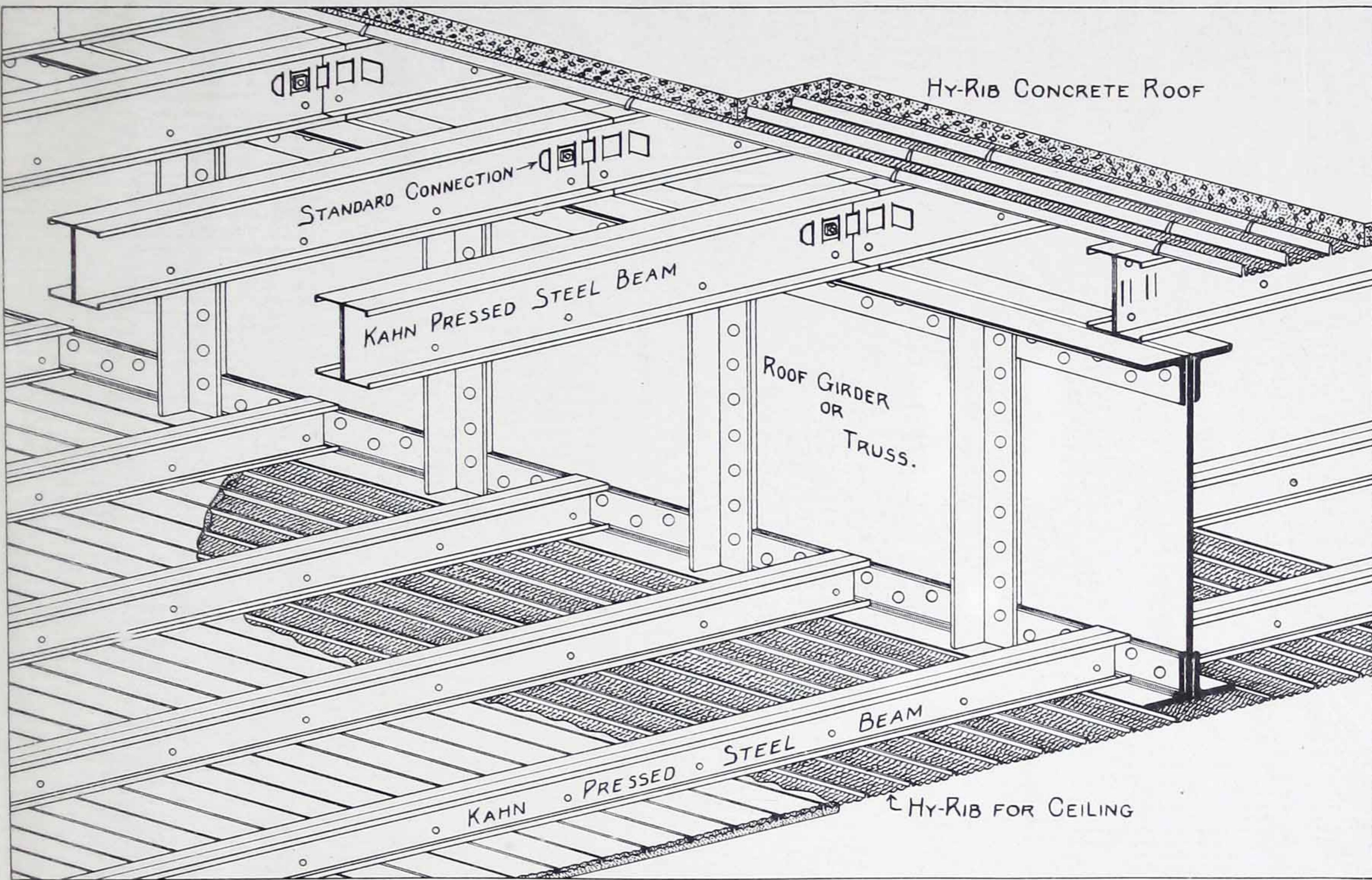
PRESSED STEEL I-BEAMS RESTING ON TOP OF  
STRUCTURAL STEEL BEAMS.



I BEAM  
PRESSED STEEL I-BEAMS SUPPORTED FROM  
STRUCTURAL STEEL BY STEEL HANGERS

# Supporting Kahn Pressed Steel Beams from Structural Steel

The photograph shows three methods by which Pressed Steel I-Beams can be supported from structural steel beams: First, by means of an angle riveted to the structural steel beams; Second, by resting the Pressed Steel Beam on top of the structural beams; and, Third, by means of a steel hanger over the top of beams. The first method is excellent but rather expensive; the second is simple and satisfactory where the projection of the steel beam below the floor slab is not objectionable, and the third is satisfactory and comparatively inexpensive.



A CEILING OF KAHN PRESSED STEEL BEAMS AND HY-RIB UNDER ROOF CONSTRUCTION.

**Safe Loads per lineal foot for Kahn Pressed Beams without deflecting more than 1/360 of the span, the maximum deflection for plastered ceilings.**

Height Inches	Index No.	Gauge	SPAN IN FEET														
			7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
3	B- 33	16	134	80	64	46	35	29	21	17	14	11	9				
		14	171	101	81	59	44	34	27	21	17	14	12	10	9		
4	B- 43	16	213	163	122	89	67	50	41	33	26	22	18	15	13		
		14	268	205	147	108	81	62	49	39	32	26	22	18	16	13	12
5	B- 54	16	350	268	211	171	138	105	83	66	54	45	37	31	27	23	20
		14	436	334	264	214	173	132	104	84	68	56	47	39	34	29	25
6	B- 63	16	370	283	224	181	149	126	106	85	69	57	48	40	34	29	25
		14	462	354	280	227	187	157	130	100	88	73	61	51	44	37	32
B- 65	16	517	396	313	254	209	176	150	123	100	82	68	52	49	42	36	31
	14	650	495	392	317	262	220	187	151	123	100	84	71	61	52	45	39
B- 74	16	546	418	331	268	221	186	158	137	119	100	83	70	56	51	44	38
	14	682	523	413	335	276	233	197	171	149	123	103	87	74	63	55	49
B- 75	16	633	484	371	310	256	215	183	158	137	115	96	81	69	59	54	44
	14	791	605	478	388	320	269	229	198	172	144	120	102	87	74	63	55
B- 84	16	657	502	397	322	265	224	190	164	143	125	111	97	83	71	61	53
	14	820	629	497	403	333	280	238	206	179	156	139	122	104	89	77	66
B- 85	16	754	579	457	370	305	257	218	188	165	144	128	111	94	81	70	60
	14	945	723	572	463	383	322	274	236	206	181	160	141	121	104	89	77
B- 95	16	887	680	537	435	359	303	257	222	193	170	151	134	120	104	89	77
	14	1108	848	671	544	449	377	321	277	242	212	188	168	150	130	120	104
B- 96	16	998	765	604	489	404	340	290	249	218	191	169	151	135	123	102	89
	14	1250	956	754	611	505	425	362	312	272	239	212	189	169	153	135	108
B-105	14	1283	982	777	629	520	437	372	321	280	246	218	194	174	158	142	130
B-106	14	1437	1101	870	705	582	490	417	359	313	275	244	218	195	176	160	144
B-125	14	1663	1274	1007	816	673	566	482	416	361	318	282	252	225	204	185	169
B-127	14	2037	1557	1231	997	823	693	590	508	443	389	345	308	276	249	226	206

$$\text{Deflection} = \frac{Wl^3}{76.8 EI}$$

For Channels which go to make up above Beams loads are one-half that given in these tables.

Loads ABOVE heavy lines are calculated by formula for stiffness; those BELOW by formula for strength.

